C-BOX 200

Installation Manual

DATALOGIC

C-BOX 200

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C-BOX 200

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GUIDE TO INSTALLATION

The following can be used as a checklist to verify all of the steps necessary for complete installation of the C-BOX 200.

1) Read all information in the section "Safety Precautions" at the beginning of this manual.

2) Correctly position and mount the C-BOX 200 within the reach of the barcode scanner cable, according to the information in paragraph 2.3.

3) Provide correct system cabling according to the signals necessary for your application and RS485 settings (see all sub-paragraphs under 2.4)

The installation is now complete.

GENERAL VIEW

C-BOX 200

Figure A

① 25-pin scanner connector

② Compression connectors

③ Cover screws (4)

C-BOX 200

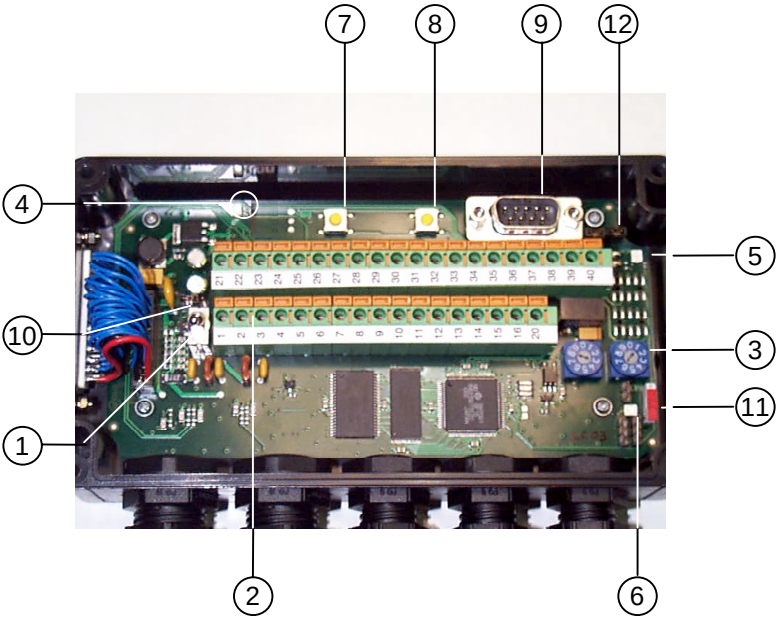


Figure B

1. Power switch (ON/OFF)
2. Spring clamp terminal blocks
3. Multidrop address switches
4. Power on LED
5. Warning LED
6. Tx LED
7. GET button
8. SEND button
9. Auxiliary port connector
10. Chassis grounding selector
11. Termination resistance switch
12. OM4000 jumpers

SAFETY PRECAUTIONS

POWER SUPPLY

ATTENTION: READ THIS INFORMATION BEFORE INSTALLING THE PRODUCT

- This product is intended to be installed by Qualified Personnel only.

The C-BOX 200 is intended to be supplied by an NEC Class 2 power source, rated 10-30 V, minimum 0.65 A.

See par. 2.4.1 for correct power supply connections.

1 GENERAL FEATURES

1.1 DESCRIPTION

The C-BOX 200 is a connection box which can be used as an accessory of the Datalogic scanners to perform the following functions:

- Facilitate the connection of the scanner signals using a spring clamp connector.
- Perform a conversion from RS232 to RS485 multidrop system to connect a RS232 scanner to a multidrop network.
- Optocoupled RS485 interface is used over long distances or in electrically noisy environments.
- Get the scanner configuration and store it in memory.
- Send the configuration stored in memory to the scanner.

The C-BOX 200 mechanical dimensions are 167 x 115 x 40 mm (6.57 x 4.53 x 1.57 in.). It weighs about 340 g. (12 oz).

Electrical connection is provided through spring clamp terminal blocks inside the C-BOX 200.

The scanner is connected to the C-BOX 200 through a 25-pin connector placed on the left side of the housing.

A 9-pin connector placed inside the C-BOX 200 facilitates connection between an external PC and the auxiliary serial interface of the scanner.

2 INSTALLATION

2.1 PACKAGE CONTENTS

Verify that the C-BOX 200 and all the parts supplied with the equipment are present and intact when opening the packaging; the list of parts includes:

1) C-BOX 200

2) Installation manual

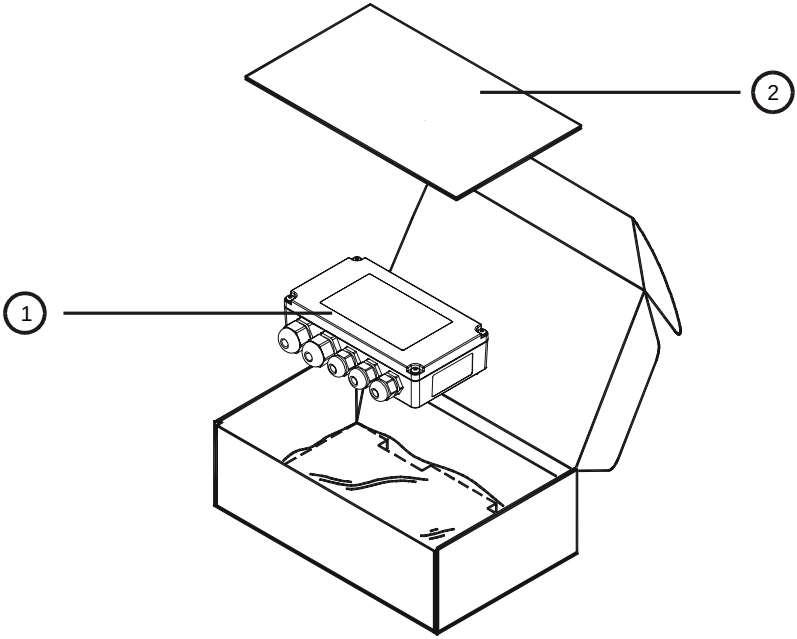


Figure 1 - C-BOX 200 package contents

2.2 OPENING THE DEVICE

To install the C-BOX 200 or during normal maintenance, it is necessary to open it by unscrewing the four cover screws:

CAUTION

The C-BOX 200 must be disconnected from the power supply during this operation.

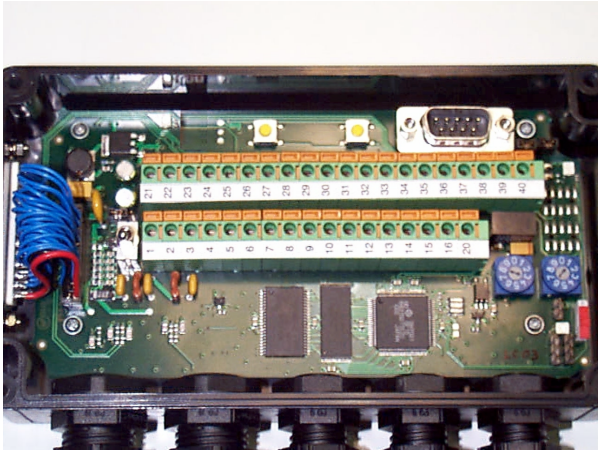


Figure 2 - Opening the C-BOX 200

It is possible to perform the following operations:

- Proceed with the cable connections (see paragraph 2.4.2).
- Set the multiplexer address selection on the rotary switches.
- Mount the C-BOX 200 to a wall or panel.

2.3 MECHANICAL INSTALLATION

The diagram below gives the overall dimensions of the C-BOX 200 and may be used for its installation.

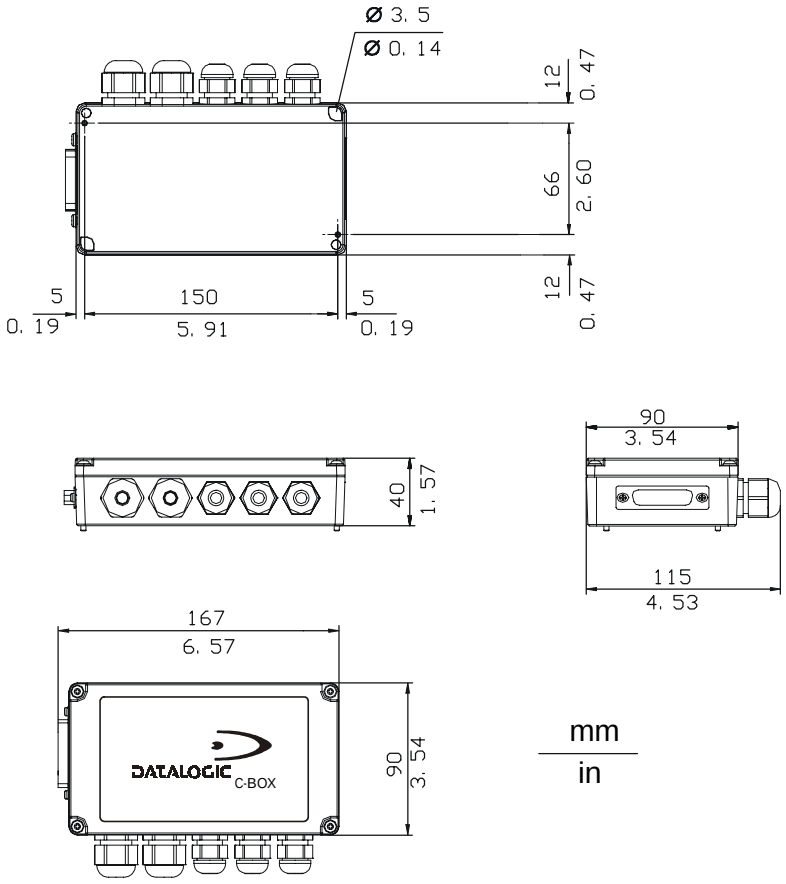


Figure 3 - Overall dimensions

C-BOX 200 can be installed to operate in different positions. The two screw holes inside the housing of the C-BOX 200 are for mechanical fixture (Figure 4).

To mount the C-BOX 200:

1) Open the C-BOX 200 by unscrewing the 4 cover screws. If necessary, using the two mounting holes inside the device as a pattern, mark the panel with an appropriate object and then drill two holes in the panel.

2) Align the C-BOX 200 and insert two screws and screw them into the panel until tight (see Figure 4).

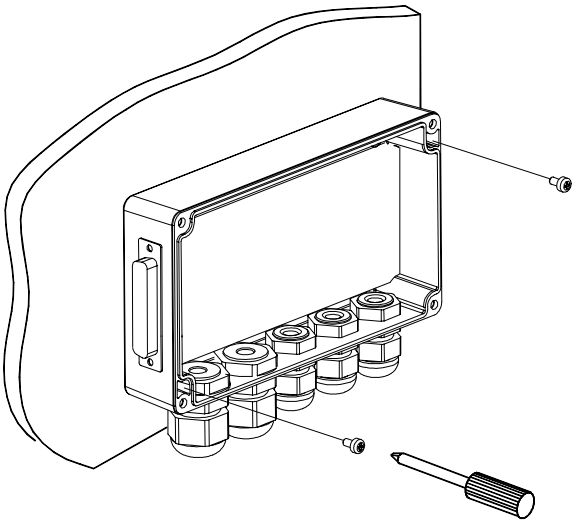


Figure 4 - Mounting C-BOX 200

2.4 ELECTRICAL CONNECTIONS AND SETUP

The following figure shows the typical layout. The dotted line in the figure refers to an optional hardware configuration.

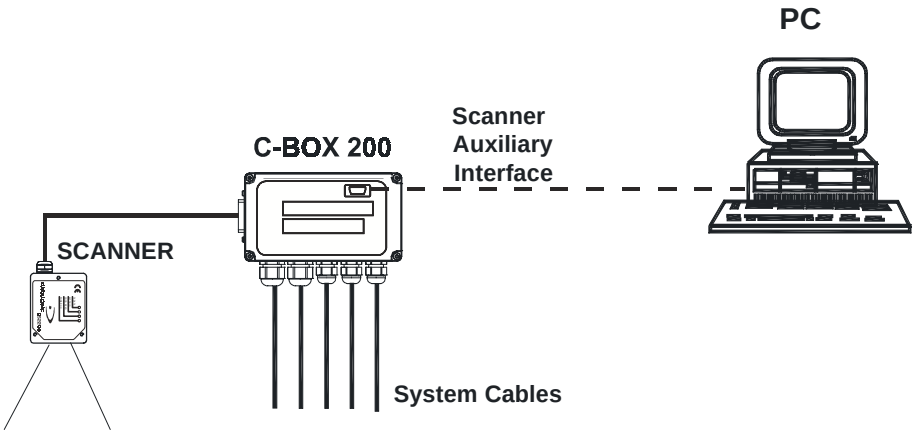


Figure 5 – System layout

A PC can be quickly connected to the C-BOX 200 (and consequently to the scanner auxiliary interface) through the internal 9-pin connector. This allows monitoring of the data transmitted by the scanner or configuration through the WinHost utility (see the scanner Installation Manual for more details). The scanner auxiliary interface signals are also available on the internal spring clamp connectors.

After making system cabling and switch settings (see sub-paragraphs under 2.4), connect the scanner to the 25-pin connector on the left side of the C-BOX 200 housing.

Switch ON the C-BOX 200 power switch (see Figure 6).

After power on, an automatic connection procedure takes place between the C-BOX 200 and the scanner. During this phase, requiring a few seconds, the warning LED is turned ON. Once the procedure had been completed successfully, the warning LED is turned OFF.

After system functioning has been verified, close the C-BOX 200 using the 4 cover screws making sure the rubber seal is fitted correctly between the parts of the housing.

2.4.1 Power Supply

Power is supplied to the C-BOX 200 through the pins provided on the spring clamp connector.

The power switch (see Figure 6) switches the power supply ON or OFF for both the C-BOX 200 and the connected scanner.

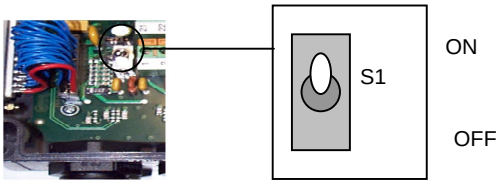


Figure 6 - Power switch ON/OFF positions

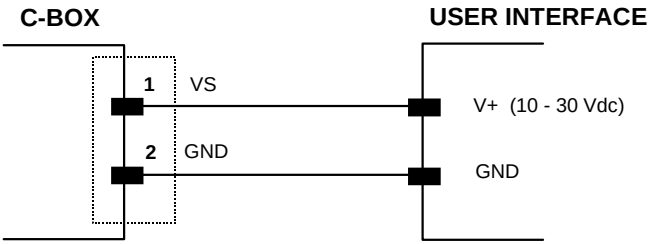


Figure 7 - Power supply connections

NOTE

Pin 1 is also electrically connected to pins 3 and 5, just as pin 2 is electrically connected to pins 4 and 6. This is useful for external trigger/inputs connections.

The power supply must be between 10 and 30 Vdc only.

2.4.2 System Wiring

The connection and wiring procedure for C-BOX 200 is described as follows:

1) Open the C-BOX 200 as described in paragraph 2.2.

2) Verify that the C-BOX 200 power switch is off (see Figure 6).

3) Unscrew the compression connectors and pass all the system cables through them into the C-BOX 200 housing.

4) To connect the power and input/output signals:
   - Prepare the individual wires of the system cables by stripping the insulation back approximately 1 cm.
   - Using a device such as a screwdriver, push down on the lever directly next to the clamp (see Figure 8).
   - Insert the wire into the clamp and release the lever.

The wire will now be held in the spring clamp.

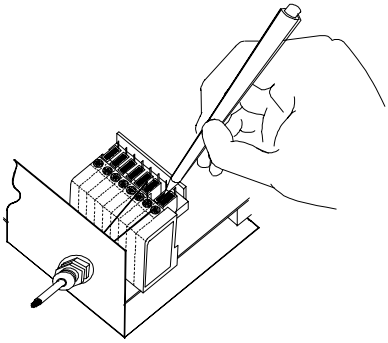


Figure 8 - System cable connections

The wiring used can be solid or stranded but must meet the following specifications.

All positions:	24 - 16 AWG	0.2 - 1.5 mm²

The C-BOX 200 spring clamp connector pinouts are indicated in the following table.

Refer to the scanner Installation Manual for details.

Pin	Name	
1, 3, 5	VS	
2, 4, 6	GND	
7, 8	EARTH GROUND	
*9, 13	RS485 CABLE SHIELD	
*10, 14	RS485 REF	
*11, 15	RTX485+	
*12, 16	RTX485-	
20, 33, 34, 40	Reserved	
21	OUT1+	
23	OUT2+	
27	EXT TRIG+	
28	EXT TRIG-	
35	TXA	
37	RXA	
39	SGND	
	DS2100 DS2400	**DS4300 DS4600**
22	OUT REF	OUT1-
24	OUT REF	OUT2-
25, 26	NC	Reserved
29	NC	IN1+
30	NC	IN1-
31	NC	IN2+
32	NC	IN2-
36	RTSA	GND
38	CTSA	SGND AUX

*The signals on pins 9, 10, 11 and 12 are repeated on pins 13, 14, 15 and 16 to facilitate network connections (i.e. Multiplexer connections using the RS485 half-duplex Interface). In this way the network bus can enter and exit the C-BOX from different spring clamps but be physically connected together.

NOTE

Pin 7 or 8 should be connected to the earth ground.

Pin 17, 18 and 19 are not present in the C-BOX 200 model.

2.4.3 Chassis Grounding Jumper Settings

The scanner chassis grounding method can be selected by positioning a jumper (see Figure 9). In this way the scanner chassis can be connected to earth ground (only if pins 7 or 8 are connected to a good earth ground) or to the power supply ground signal. The scanner chassis can also be left floating but, in this case, the jumper must be removed.

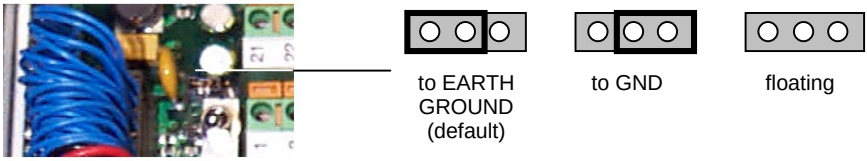


Figure 9 – Chassis grounding

The C-BOX 200 is now installed which completes the electrical connections for your scanning system.

2.4.4 Multidrop Address Selection

For RS485 half-duplex interface connections, the scanner multidrop address should be set using the rotary switches placed inside the C-BOX 200.

The valid address range is from 00 to 31. This value is read only at power-on; any change at run-time has no effect.

If an invalid value is detected (32-99) the C-BOX cannot communicate with the Multiplexer and the green LED remains off. Furthermore, the SEND command configures the scanner using the previously configured valid scanner address.

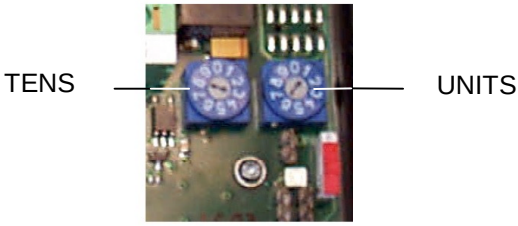


Figure 10 - Rotary switches

2.4.5 RS485 Bus Termination

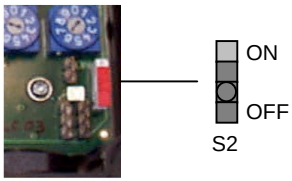


Figure 11 - Termination resistance switch

The switch S2 enables or disables the insertion of the bus termination resistor for RS485 Half Duplex Multidrop applications.

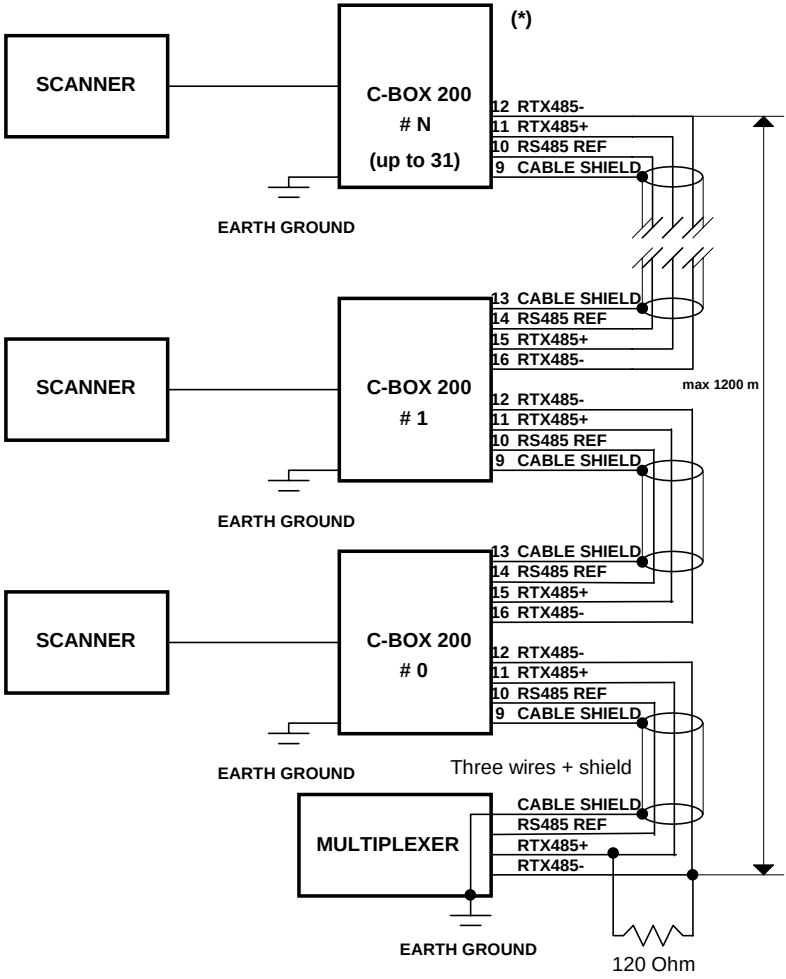
CAUTION

In Multiplexer applications the termination resistor must be enabled ONLY on the last device of the chain, the farthest away from the Multiplexer (assuming the Multiplexer is the first device of the chain). On all the other devices this resistor MUST NOT be enabled (S2 = OFF).

Normally it is not necessary to enable the terminator resistor (S2 always OFF); it is suggested only in applications where the communication speed or the bus length are critical parameters.

2.4.6 Connection to a Multiplexer

The following figure shows a multidrop layout with C-BOX 200 devices connected to a Multiplexer:



(*) If necessary enable the termination resistor only in the last device.

Figure 12 - Multiplexer connection

2.4.7 OM4000 Jumper Settings

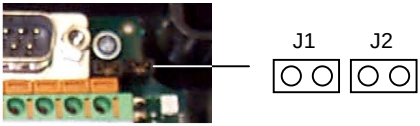


Figure 13 - OM4000 jumpers

The jumpers allow connection to the EXT TRIG signals on separate spring clamp terminals for applications which use the OM4000 Oscillating Mirror in Trigger Mode.

They are used together and they have the following significance:
when a jumper is in the J1 position (see Figure above) pin 40 is connected to pin 27 (EXT TRIG+); a jumper in J2 position connects pin 20 to pin 28 (EXT TRIG-).

If the jumpers are removed pin 20 and pin 40 are disconnected.

2.5 9-PIN SCANNER AUXILIARY SERIAL INTERFACE

The scanner auxiliary serial interface available on the internal 9-pin connector can be used either for configuration through WinHost or for data monitoring.

The details of the connector pins are indicated in the following table:

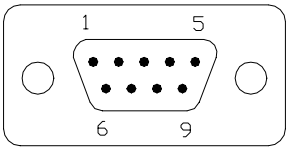


Figure 14 - 9-pin male connector

9-pin connector pinout		
Pin	**Name**	**Function**
1		N.C.
2	RXA	Auxiliary RS232
3	TXA	Auxiliary RS232
4		N.C.
5	SGND	Signal Ground
6		N.C.
9		N.C.
	DS2100 - DS2400	
7	CTSA	Auxiliary Handshake RS232
8	RTSA	Auxiliary Handshake RS232
	DS4300 - DS4600	
7	SGND AUX	Auxiliary Signal Ground
8	GND	Ground

2.6 SCANNER REQUIREMENTS

1) The C-BOX 200 can be connected to the following scanners through the 25-pin connector illustrated in Figure A.

DS2100	DS4300
DS2400	DS4600

It is necessary to use RS232 model (X0XX) for DS2100 and DS2400 scanner, while DS4300 and DS4600 RS232 interface must be selected by the user.

2) At least one Terminator Character should be enabled in the connected scanner (see the Terminator parameters in the Data Format section of the Help On Line).

3) It is necessary to set the scanner main interface communication speed (Baud Rate), so that it is the same as the Multidrop bus speed. In fact, during the connection procedure, the C-BOX 200 gets its main interface speed from the scanner to initialize its RS485 Multidrop optocoupled serial interface. If both the baud rate and the device address are correct the communication takes place which causes the green LED to blink slightly.

The device address must be pre-set through the two rotary switches S4 and S5 (see Figure 10).

2.7 OPERATING MODES

Once the connection procedure is completed (the warning LED is OFF), the C-BOX 200 is ready to receive code strings from the scanner's RS232 main interface. Then, it converts them to the RS485 multidrop network by using MUX32 protocol.

Through the C-BOX 200 internal buttons, it is possible to communicate with the scanner to perform one of the following functions:

- Get scanner configuration
- Send a configuration to the scanner

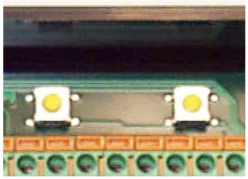
At the end of each function the scanner returns to the previous operating mode.

2.7.1 GET/SEND Buttons

The C-BOX 200 has two internal function buttons (GET, SEND). The procedure to enable the GET/SEND function is the following:

1. Press both the buttons GET and SEND at the same time for at least one second; the warning LED is turned ON.

2. Release the buttons.



GET SEND

3. Press the left button corresponding to the GET function **or** press the right button corresponding to the SEND function.

GET – (left button): the C-BOX 200 reads the current scanner configuration and permanently copies it in its own memory support (EEPROM). The C-BOX 200 preserves this configuration also when switched off.

SEND - (right button): the C-BOX 200 sends the configuration previously stored in its own permanent memory support to the scanner's EEPROM.

NOTE

Once the buttons are released in step 1, a ten-second timeout starts. If no button is pressed within this time, the procedure will be cancelled.
In any case, the warning LED is turned OFF at the end of each procedure.

2.7.2 LED Indicators

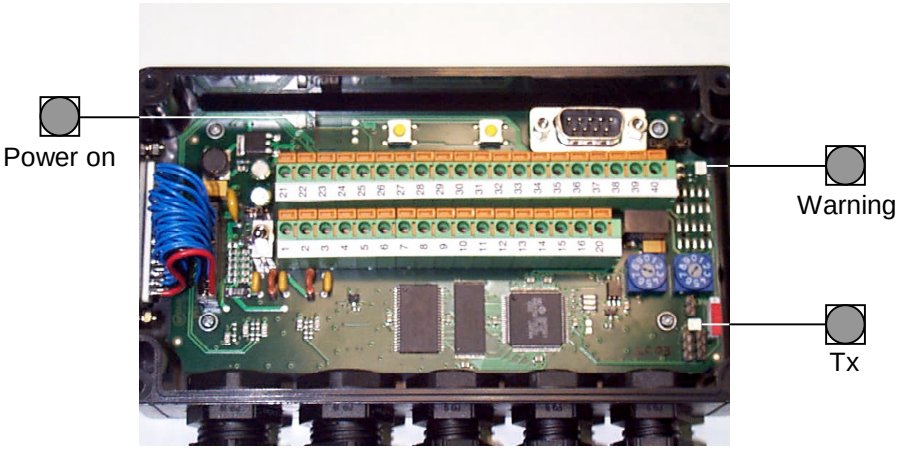


Figure 15 - LED Indicators

The three internal LEDs of the C-BOX 200 (see Figure 15) indicate the following:

POWER ON (red) indicates the C-BOX 200 is connected to the power supply and the power switch is ON.

WARNING (red) indicates a warning or error condition: it is ON when a connection procedure is in progress (the system is busy) or during a GET/SEND procedure. It blinks when an error condition occurs. Normally this LED should be OFF.

TX (green) indicates the RS485 Multidrop activity. When communication takes place, this LED will blink slightly.

3 TECHNICAL FEATURES

ELECTRICAL FEATURES	
Power	
Supply voltage	10 to 30 Vdc
Power consumption max.	1.4 W + scanner
USER INTERFACE	
LED indicators	Power ON, Warning, Tx (RS485 Multidrop activity)
PHYSICAL FEATURES	
Mechanical dimensions	167 x 115 x 40 mm (6.57 x 4.53 x 1.57 in.)
Weight	about 340 g. (12 oz.)
SOFTWARE FEATURES	
Parameter storage	Non-volatile internal memory
ENVIRONMENTAL FEATURES	
Operating temperature	-10 to 50 °C (14 to 122 °F)
Storage temperature	-20 to 70 °C (-4 to 158 °F)
Humidity max.	90% non condensing
Vibration resistance	IEC 68-2-6 test FC 1.5 mm; 10 to 55 Hz; 2 hours on each axis
Shock resistance	IEC 68-2-27 test EA 30G; 11 ms; 3 shocks on each axis
Protection class	IP64 (when correctly connected to the scanner)

NOTE

The features given are typical at a 25 °C ambient temperature (if not otherwise indicated).

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declares that the
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and all its models
et tous ses modèles
und seine modelle
y todos sus modelos

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are in conformity with the requirements of the European Council Directives listed below:
sont conformes aux spécifications des Directives de l'Union Européenne ci-dessous:
der nachstehend angeführten Direktiven des Europäischen Rats:
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Cette déclaration repose sur la conformité des produits aux normes suivantes:
Diese Erklärung basiert darauf, daß das Produkt den folgenden Normen entspricht:
Esta declaración se basa en el cumplimiento de los productos con las siguientes normas:

EN 55022, August 1994: LIMITS AND METHODS OF MEASUREMENTS OF RADIO DISTURBANCE CHARACTERISTICS OF INFORMATION TECHNOLOGY EQUIPMENT (ITE)

EN 50082-2, March 1995: ELECTROMAGNETIC COMPATIBILITY. GENERIC IMMUNITY STANDARD. PART 2: INDUSTRIAL ENVIRONMENT

Ruggero Cacioppo

Lippo di Calderara, 07/03/2001

Quality Assurance Supervisor